8-Port 10/100Mbps PoE Fast Ethernet Switch

FSD-808P

User's Manual

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FCC Warning

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the Instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CE Mark Warning

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

Energy Saving Note of the Device

This power required device does not support Standby mode operation.

For energy saving, please remove the power cable to disconnect the device from the power circuit.

Without removing power cable, the device will still consume power from the power source. In view of Saving the Energy and reduce the unnecessary power consumption, it is strongly suggested to remove the power connection for the device if this device is not intended to be active.

WEEE Warning

To avoid the potential effects on the environment and human health as a result of the presence of hazardous substances in electrical and electronic equipment, end users of electrical and electronic equipment should understand the meaning of the crossed-out wheeled bin symbol. Do not dispose of WEEE as unsorted municipal waste and have to collect such WEEE separately.

Revision

PLANET 8-Port 10/100Mbps PoE Fast Ethernet Switch User's Manual

For Model: FSD-808P

Revision: 2.0 (March, 2014)

Part No.: 2351-A31190-004

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1. Introduction

1.1 Checklist

Check the contents of your package for the following parts:

- FSD-808P x 1
- User's Manual x 1
- Power Cord x 1
- Two Rack-mounting Brackets with Attachment Screws x 8

If any of these pieces are missing or damaged, please contact your dealer immediately; if possible, retain the carton including the original packing material, and use them again to repack the product in case there is a need to return it to us for repair.

1.2 Product Description

To fulfill the demand of sufficient PoE power for network applications with Fast Ethernet transmission performance, the FSD-808P, a new member of the 802.3af PoE Fast Ethernet Switch family, is an 8-port 10/100Mbps Power over Ethernet Switch, which features high performance Fast Ethernet IEEE 802.3af PoE (up to 15.4 watts) with a total of 125-watt PoE budget. Its eight 802.3af PoE ports, with PoE power injector function, are able to drive eight IEEE 802.3af compliant powered devices. The FSD-808P also provides a simple, cost-effective, and non-blocking wire-speed performance in a compact 12-inch metal housing for desktop deployment for SOHO office or department network application.

All RJ45 copper interfaces in the FSD-808P support 10/100Mbps auto-negotiation for optimal speed detection over RJ45 Category 5 or 5e cabling. It also supports standard auto-MDI/MDI-X that can detect the type of connection to any Ethernet device without requiring special straight-through or crossover cable.

1.3 Features

- **RJ45 Interface**
  - ♦ Eight 10/100Mbps Fast Ethernet ports
  - ♦ 8 ports support 48V DC power to PoE powered device
- **Power over Ethernet**
  - ♦ Complies with IEEE 802.3af Power over Ethernet End-Span PSE
  - ♦ Up to 8 IEEE 802.3af devices powered
  - ♦ Supports PoE Power up to 15.4 watts for each PoE port
  - ♦ Auto detects powered device (PD)
  - ♦ Circuit protection prevents power interference between ports
  - ♦ Remote power feeding up to 100m
- **Switching**
  - ♦ Hardware based 10/100Mbps auto-negotiation and auto MDI/MDI-X
  - ♦ Flow control for full duplex operation and back pressure for half duplex operation
  - ♦ Integrates address look-up engine, supporting 2K absolute MAC addresses
  - ♦ Automatic address learning and address aging
- **Hardware**
  - ♦ 12-inch desktop size, 1U height
  - ♦ LED indicators for PoE ready and PoE activity
  - ♦ Fanless design

1.4 Specifications

Model	**FSD-808P** 8-Port 10/100Mbps PoE Fast Ethernet Switch
Hardware Specifications	
Hardware Version	2
Network Connector	8-Port RJ45 for 10/100Base-TX
PoE Inject Port	8-Port with 802.3af PoE injector function
LED Display	System: Power (Green) Per port: PoE (Green) LNK/ACT (Green)
Switch Architecture	Store and Forward switch architecture
MAC Address	2K MAC address table with auto learning function
Switch Fabric	1.6Gbps
Switch Throughput	1.19Mpps@64Bytes
Power Requirement	AC 100~240V, 50/60Hz, 1.2A max.
Power Consumption	Max.135 watts / 460 BTU
Dimensions (W x D x H)	280 x 180 x 43 mm
Weight	1.65kg
Power over Ethernet	
PoE Standard	IEEE 802.3af Power over Ethernet / PSE
PoE Power Supply Type	End-Span
PoE Power Output	Per Port 48V DC, 350mA. max. 15.4 watts
Power Pin Assignment	1/2(+), 3/6(-)
PoE Power Budget	125 watts
Standard Conformances	
Regulation Compliance	FCC Class A, CE
Standard Compliance	IEEE 802.3 Ethernet IEEE 802.3u Fast Ethernet IEEE 802.3x Flow Control IEEE 802.3af Power over Ethernet
Environment	
Operating Temperature	0 ~ 50 degrees C
Storage Temperature	-40 ~ 70 degrees C
Operating Humidity	5 ~ 95%, relative humidity, non-condensing
Storage Humidity	5 ~ 95%, relative humidity, non-condensing

2. Hardware Description

The FSD-808P provides two different running speeds -- 10Mbps and 100Mbps -- and can automatically distinguish the speed of the incoming connection.

This section describes the hardware features of the FSD-808P. For easier management and control of the Switch, familiarize yourself with its display indicators and ports. Front panel illustrations in this chapter display the unit LED indicators. Before connecting any network device to the FSD-808P, please read this chapter carefully.

2.1 Front Panel

The Front Panel of the FSD-808P PoE Ethernet Switch consists of 8x auto-sensing 10/100Mbps Ethernet RJ45 ports. The LED Indicators are also located on the front panel of the FSD-808P.

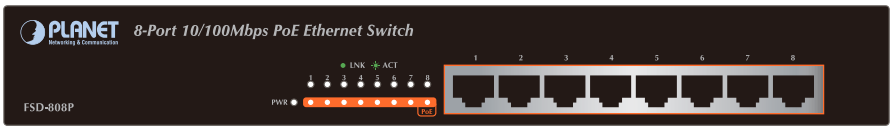


Figure 2-1: FSD-808P Switch Front Panel

2.1.1 LED Indicators

■ **System**

LED	Color	Function
PWR	Green	**Light:** Indicates the Switch has power.

■ **Per 10/100Mbps Port**

LED	Color	Function
PoE	Green	**Light:** Indicates the port is providing 48V DC in-line power.
LNK/ACT	Green	**Light:** Indicates the link through that port is successfully established. **Blink:** Indicates that the Switch is actively sending or receiving data over that port.

2.2 Rear Panel

The rear panel of the FSD-808P indicates an AC inlet power socket, which accepts input power from 100 to 240V AC, 50-60Hz.

Figure 2-2: FSD-808P Switch Rear Panel

Power Notice

1. The device is a power-required device, meaning it will not work till it is powered. If your networks should be active all the time, please consider using UPS (Uninterrupted Power Supply) for your device. It will prevent you from network data loss or network downtime.
2. In some areas, installing a surge suppression device may also help to protect your FSD-808P from being damaged by unregulated surge or current to the FSD-808P or the power adapter.

3. Hardware Installation

Start up

Please refer to the following for your cabling:

10/100Base-TX

All 10/100Base-TX ports come with auto-negotiation capability. They automatically support 100Base-TX and 10Base-T networks. Users only need to plug a working network device into one of the 10/100Base-TX ports, and then turn on the FSD-808P. The port will automatically run at 10Mbps, 20Mbps, 100Mbps or 200Mbps after negotiating with the connected device.

Cabling

Each 10/100Base-TX port uses RJ45 sockets -- similar to phone jacks -- for connection to unshielded twisted-pair cable (UTP). The IEEE 802.3 / 802.3u Fast Ethernet standard requires Category 5, 5e UTP for 100Mbps 100Base-TX. 10Base-T networks can use Cat. 3, 4 and 5 (see table below). Maximum distance is 100 meters (328 feet).

Port Type	Cable Type	Connector
10Base-T	Cat. 3, 4, 5, 2-pair	RJ45
100Base-TX	Cat. 5, 5e UTP, 2-pair	RJ45

Any Ethernet devices like hubs/PCs can connect to the FSD-808P by using straight-through wires. The eight 10/100Mbps ports are auto-MDI/MDI-X, which can be used on straight-through or crossover cable.

3.1 Desktop Installation

To install the Switch on desktop, simply follow the following steps:

Step 1 Attach the rubber feet to the recessed areas on the bottom of the Switch as shown in Figure 3-1.

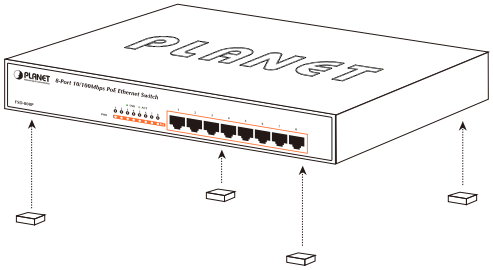
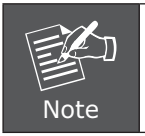


Figure 3-1: Attaching the Rubber Feet to the PoE Fast Ethernet Switch

Step 2: Place the Switch on desktop near an AC power source.

Step 3: Keep enough ventilation space between the Switch and the surrounding objects.

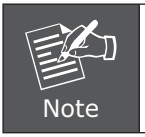


When choosing a location, please keep in mind the environmental restrictions discussed in Chapter 1, Section 4, in Specification.

Step 4: Connect your Switch to 802.3af complied Power Devices (PD) and other network devices.

A. Connect one end of a standard network cable to the 10/100 RJ45 ports on the front panel of the Switch.

B. Connect the other end of the cable to the network devices such as printer servers, workstations or routers, etc.



Connection to the Switch requires UTP Category 5, 5e, 6 network cabling with RJ45 tips. For more information, please see the Cabling Specifications in Appendix A.

Step 5: Supply power to the Switch.

A. Connect one end of the power cable to the Switch.

B. Connect the power plug of the power cable to a standard wall outlet.

When the Switch receives power, the Power LED should remain solid Green.

3.2 Rack Mounting

To install the Switch in a **19-inch** standard rack, follow the instructions described below.

Step 1: Place your PoE Fast Ethernet Switch on a hard flat surface, with the front panel positioned towards your front side.

Step 2: Attach a rack-mount bracket to each side of the Switch with supplied screws attached to the package. Figure 3-2 shows how to attach brackets to one side of the Switch.

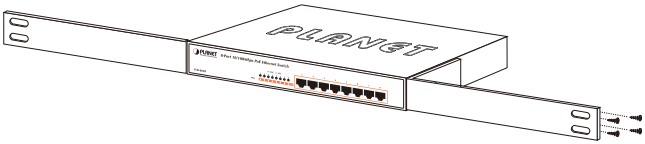


Figure 3-2: Attaching the Brackets to the Switch.

Note

You must use the screws supplied with the mounting brackets. Damage caused to the parts by using incorrect screws would invalidate the warranty.

Step 3: Secure the brackets tightly.

Step 4: Follow the same steps to attach the second bracket to the opposite side.

Step 5: After the brackets are attached to the Switch, use suitable screws to securely attach the brackets to the rack, as shown in Figure 3-3.

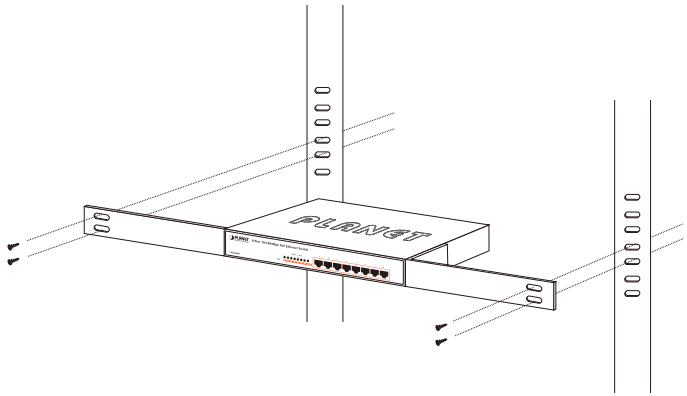


Figure 3-3: Mounting the Switch in a Rack

Step 6: Proceed with Steps 4 and 5 under **session 3.1 Desktop Installation** to connect the network cabling and supply power to your Switch.

3.3 Product Applications

3.3.1 Connecting end node or Switch

1. Place the FSD-808P on a smooth surface or fasten the mounting brackets purchased separately with the provided screws in a standard **19"** rack.
2. Connect the power cord to the power inlet socket of the FSD-808P and the other end into the local power source outlet. When the Switch receives power, the Power LED should remain solid Green.
3. Connect the other switch or PC to one port of the FSD-808P using Category 3/4/5/5e UTP/STP cabling.
4. Connect another switch or PC to the other port of the FSD-808P by following the same process as described in Step 3.

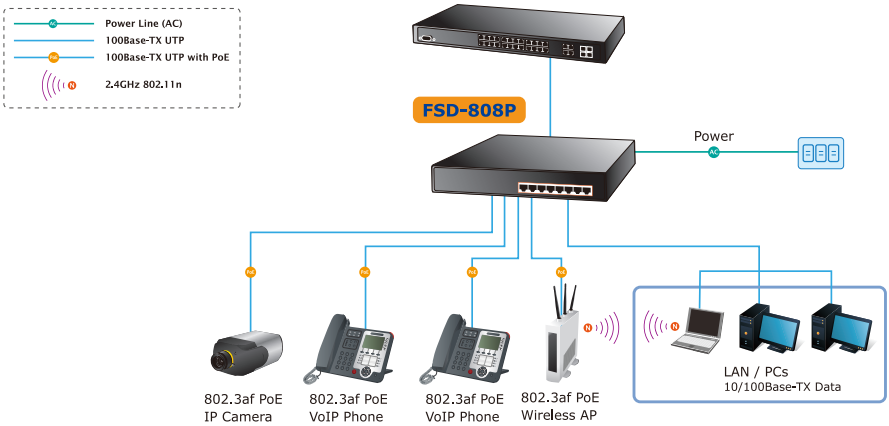


Figure 3-4: End Node or Switch Connection

Note

Cable Distance for Switch

The cable distance between the FSD-808P and PC should not exceed 100 meters for UTP/STP cable.

Make sure the wiring is correct

ICategory 3/4/5 cable can be used for 10Mbps operation. To reliably operate your network at 100Mbps, you must use an Unshielded Twisted-Pair (UTP) Category 5/5e cable, or better Data Grade cabling. While a Category 3 or 4 cable may initially seem to work, it will soon cause data loss.

3.3.2 Department/ Workgroup PoE Switch:

Providing eight PoE in-line power interfaces, the FSD-808P can easily build a power centrally-controlled IP phone system, IP Camera system and Wireless AP group for the enterprise. For instance, up to 8 cameras can be installed around the corner in the company for surveillance demands or up to 8 Wireless AP to build a wireless roaming environment in the office. Without the power-socket limitation, the Switch makes the installation of cameras or wireless AP easier and more efficient.

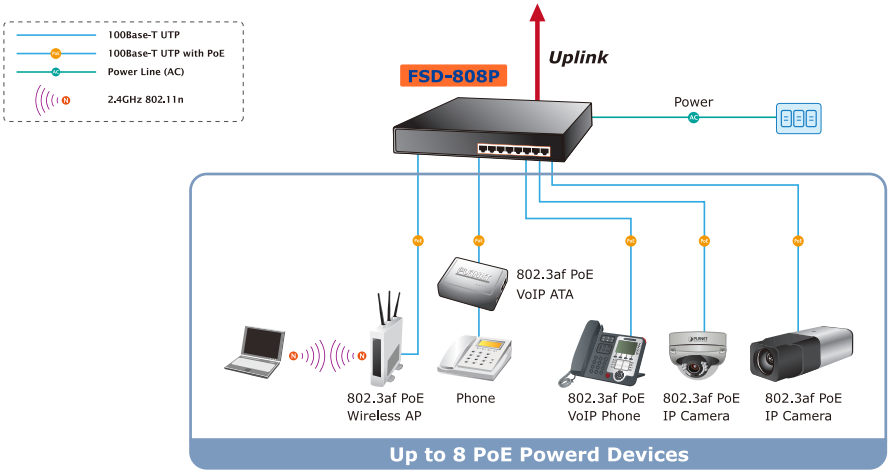


Figure 3-5: Department / Workgroup PoE Switch Connection

3.4 Power over Ethernet Powered Device

3~5 watts	**Voice over IP phones** Enterprise can install PoE VoIP Phone, ATA and other Ethernet/ non-Ethernet end-devices to the central where UPS is installed for uninterruptible power system and power control system.
6~12 watts	**Wireless LAN Access Points** Access points can be installed anywhere in Museums, Tourist Sites, Airports, Hotels, Campuses, Factories and, Warehouses.
10~12 watts	**IP Surveillance** IP cameras can be installed in any location in Enterprises, Museums, Campuses, Hospitals and Banks. No electrician is needed as IP power is used.
3~12 watts	**PoE Splitter** PoE Splitter splits the PoE 48V DC over the Ethernet cable into 5/12V DC power output. It frees the device deployment from restrictions due to power outlet locations, which eliminate the costs for additional AC wiring and reduce the installation time.

4. Power over Ethernet Overview

What is PoE?

Based on the global standard IEEE 802.3af, PoE is a technology for wired Ethernet, the most widely installed local area network technology adopted today. PoE allows the electrical power necessary for the operation of each end-device to be carried by data cables rather than by separate power cords. New network applications, such as IP Cameras, VoIP Phones, and Wireless Networking, can help enterprises improve productivity. It minimizes wires that must be used to install the network for offering lower cost, and less power failures.

IEEE 802.3af also called Data Terminal equipment (DTE) power via Media dependent interface (MDI) is an international standard to define the transmission for power over Ethernet. The 802.3af is delivering 48V power over RJ45 wiring. Besides, 802.3af also defines two types of source equipment: Mid-Span and End-Span.

- **Mid-Span**

  Mid-Span device is placed between legacy switch and the powered device. Mid-Span is tap the unused wire pairs 4/5 and 7/8 to carry power; the other four are for data transmission.

- **End-Span**

  End-Span device is directly connected with powered device. End-Span could also tap wires 1/2 and 3/6.

PoE System Architecture

The specification of PoE typically requires two devices: the **Powered Source Equipment (PSE)** and **the Powered Device (PD)**. The PSE is either an End-Span or a Mid-Span, while the PD is a PoE-enabled terminal, such as IP Phones, Wireless LAN, etc. Power can be delivered over data pairs or spare pairs of standard CAT-5 cabling.

How is Power Transferred Through the Cable

A standard CAT5 Ethernet cable has four twisted pairs, but only two of these are used for 10BASE-T and 100BASE-T. The specification allows two options for using these cables for power as shown in Figure 2 and Figure 3:

The spare pairs are used. Figure 2 shows the pair on pins 4 and 5 connected together and forming the positive / negative supply, and the pair on pins 7 and 8 connected and forming the positive / negative supply. (In fact, a late change to the spec allows either polarity to be used)

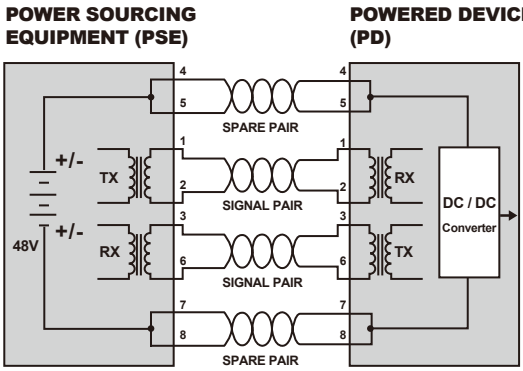


Figure 1 - Power Supplied over the Spare Pins

The data pairs are used. Since Ethernet pairs are transformers coupled at each end, it is possible to apply DC power to the center tap of the isolation transformer without upsetting the data transfer. In this mode of operation the pair on pins 3 and 6 and the pair on pins 1 and 2 can be of either polarity.

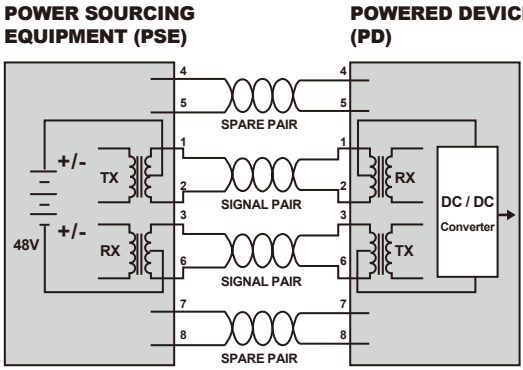


Figure 2 - Power Supplied over the Data Pins

When to install PoE

Consider the following scenarios:

- You're planning to install the latest VoIP Phone system to minimize cabling building costs when your company moves into a new office next month.
- The company staff has been clamoring for a wireless access point in the picnic area behind the building so they can work on their laptops through lunch, but the cost of electrical power to the outside is not affordable.
- Management asks for IP Surveillance Cameras and business access systems throughout the facility, but they would rather avoid another electrician's payment.

References:

IEEE Std 802.3af-2003 (Amendment to IEEE Std 802.3-2002, including IEEE Std 802.3ae-2002), 2003 Page(s):0_1-121

White Paper on Power over Ethernet (IEEE 802.3af)
http://www.poweroverethernet.com/articles.php?article_id=52

Microsemi / PowerDsine
http://www.microsemi.com/PowerDsine/

Linear Tech
http://www.linear.com/

5. Troubleshooting

This chapter contains information to help you solve problems. If the Switch is not functioning properly, make sure the Ethernet Switch was set up according to instructions in this manual.

The Link LED is not lit.

Solution:

Check the cable connection and remove duplex mode of the Switch.

Performance is bad.

Solution:

Check the full duplex status of the Switch. If the Ethernet Switch is set to full duplex and the partner is set to half duplex, then the performance will be poor.

100Base-TX port link LED is lit, but the traffic is irregular.

Solution:

Check whether the attached device is not set to dedicate full duplex. Some devices use a physical or software switch to change duplex modes. Auto-negotiation may not recognize this type of full-duplex setting.

Why the Switch doesn't connect to the network.

Solution:

Check the LNK/ACT LED on the switch. Try another port on the Switch. Make sure the cable is installed properly. Make sure the cable is the right type. Turn off the power. After a while, turn on the power again.

Why connecting PoE device to FSD-808P cannot be powered on.

Solution:

Please check the cable type of the connection from the FSD-808P (port 1 to port 8) to the other end. The cable should be an 8-wire UTP, Category 5 or above, EIA568 cable within 100 meters. A cable with only 4-wire, short loop or over 100 meters will affect the power supply.

Please check and assure the device is fully complied with IEEE 802.3af standard.

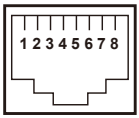
What is the power output of each IEEE 802.af PoE port?

Solution:

Each PoE port supports **48V DC, 350mA, max 15.4-watt** power output. Detect and inject by the standard of IEEE 802.3af.

Appendix A Networking Connection

A.1 DATA OUT PoE Switch RJ45 Port Pin Assignments (Port 1 to Port 8)



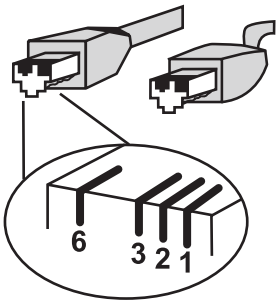
PIN NO	RJ45 SIGNAL ASSIGNMENT
1	● Output Transmit Data +
2	● Output Transmit Data –
3	● Receive Data +
4	● Negative Power –
5	● Negative Power –
6	● Receive Data –
7	● Positive Power +
8	● Positive Power +

A.2 10/100Mbps, 10/100Base-TX

When connecting the Switch to another Fast Ethernet switch, a straight-through or crossover cable might be necessary. Each port of the Switch supports auto-MDI/ MDI-X detection. That means you can directly connect the Switch to any Ethernet devices without making a crossover cable. The following table and diagram show the standard RJ45 receptacle/ connector and their pin assignments:

RJ45 Connector pin assignment		
Contact	MDI Media Dependent Interface	MDI-X Media Dependent Interface-Cross
1	Tx + (transmit)	Rx + (receive)
2	Tx – (transmit)	Rx – (receive)
3	Rx + (receive)	Tx + (transmit)
4, 5	Not used	
6	Rx – (receive)	Tx – (transmit)
7, 8	Not used	

The standard cable, RJ45 pin assignment



The standard RJ45 receptacle/connector

There are 8 wires on a standard UTP/STP cable and each wire is color-coded. The following shows the pin allocation and color of straight cable and crossover cable connection:

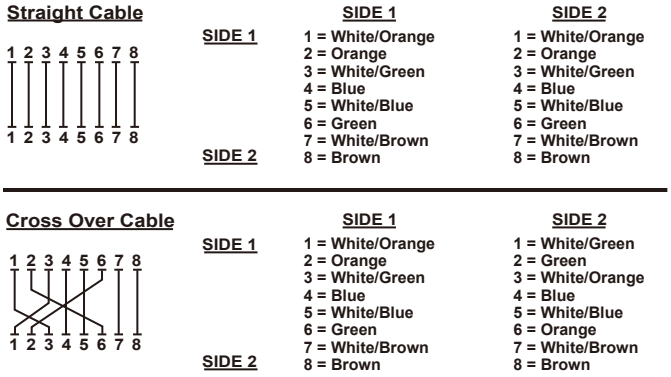


Figure A-1: Straight-through and Crossover Cables

Please make sure your connected cables are with the same pin assignment and color as the above diagram before deploying the cables into your network.

EC Declaration of Conformity

For the following equipment:

*Type of Product : 8-Port 10/100Mbps PoE Fast Ethernet Switch
*Model Number : FSD-808P
* Produced by:
Manufacturer's Name : **Planet Technology Corp.**
Manufacturer's Address : 10F., No.96, Minquan Rd., Xindian Dist.,
New Taipei City 231, Taiwan (R.O.C.).

is herewith confirmed to comply with the requirements set out in the Council Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility Directive on (2004/108/EC).
For the evaluation regarding the EMC, the following standards were applied:

EN 55022	(2006 + A1:2007)
EN 55024	(1998 + A1:2001 + A2:2003)
EN 60950-1	(2006 + A11:2009 + A1:2010)

Responsible for marking this declaration if the:

☒ **Manufacturer** ☐ **Authorized representative established within the EU**

Authorized representative established within the EU (if applicable):

Company Name: **Planet Technology Corp.**

Company Address: **10F., No.96, Minquan Rd., Xindian Dist., New Taipei City 231, Taiwan (R.O.C.)**

Person responsible for making this declaration

Name, Surname **Kent Kang**

Position / Title : **Product Manager**

Taiwan	**25, Aug., 2011**	
Place	*Date*	*Legal Signature*

PLANET TECHNOLOGY CORPORATION

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